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including, Wisconsin Card Sorting Test, Stroop Test, Operational Word Span, The Cancellation Test, Serial Digit Learning Test, Feeling-of-knowing paradigm, and the Metacognition Questionnaire-30. Two experimental paradigms were used to investigate regional brain activations. A Go/NoGo task was used to measure response inhibition, and n-Back Task was used to measure working memory processing. Regional brain activations were measured using fMRI technology (1.5 Tesla Siemens Magnetom Symphony).

**Results:** Compared to the healthy controls, youth with OCD showed impairment on some executive functions and metacognition tasks. Also, OCD patients showed greater activations in the areas of inferior frontal gyrus, temporal pole, and parahippocampal gyrus during response inhibition task; on the other hand patients showed greater activations in the area of inferior parietal lobule during working memory processing.

**Conclusion:** Consistent with previous results, present findings indicated that ventral prefrontal cortical regions were basic brain structures involved in the pathophysiology of OCD.

**Keywords:** metacognition, executive functions, obsessive compulsive disorder, ventral prefrontal cortical regions.

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### The Nature of Action Knowledge Deficits in Amyotrophic Lateral Sclerosis

Egberdina-Józefa van der Hulst, Sharon Abrahams, Thomas H. Bak

#### Introduction

Previous research has suggested that Amyotrophic Lateral Sclerosis (ALS) patients with and without dementia show deficits in the processing of action knowledge. The debate on whether this deficit is pathognomic for ALS is ongoing and the exact nature of this phenomenon remains to be elucidated. Our study aimed to explore whether within the action processing domain a further distinction can

be made between syntagmatic and paradigmatic type of processing.

#### Methods

Twenty-three, non-demented ALS-patients were compared to 22 healthy controls (HCs) matched for age, education and sex and administered a neuropsychological battery of tests. This included tests of semantic association for Objects and Actions (O&A), as well as knowledge of Action Sequencing (AS). Both reaction times (RTs) and error rates were recorded.

#### Results

MANOVAs revealed significantly longer RTs ( $p=.017$ ) and more errors ( $p=.014$ ) for ALS patients than for HCs on AS, while both groups displayed equally long RTs ( $ps >.167$ ) and amount of errors ( $ps >.163$ ) on O&A. Taking out the possible influence of motor slowing, basic motor speeds were then subtracted in all three conditions, yielding cognitive decision times (CDTs). ALS patients exhibited longer CDTs on AS than HCs ( $p=.022$ ), whereas CDTs for O&A were equal across groups ( $ps >.237$ ).

#### Conclusions

Action knowledge deficits were detected in our population of non-demented ALS patients. However, within the action domain, a disproportionate impairment was found for syntagmatic processing of action knowledge. Our results raise the question whether deficits in syntagmatic processing might be the driving force behind the action impairment in MND.

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### Parkin Mutasyonlu Parkinson Hastalarındaki Kognitif Süreçlerin Nöropsikolojik Testlerle Değerlendirilmesi

Hasan Demirci<sup>1</sup>, Atilla Uslu<sup>2</sup>, Ebba Lohmann<sup>3</sup>, Haşmet Hanağası<sup>3</sup>, Tamer Demiralp<sup>2</sup>

<sup>1</sup>*İstanbul Üniversitesi, Deneysel Tıp Araştırma Enstitüsü, Sinirbilim Anabilim dalı, 34093 Çapa, İstanbul, Türkiye*

<sup>2</sup>*İstanbul Üniversitesi, İstanbul Tıp Fakültesi, Fizyoloji Anabilim Dalı, 34093 Çapa, İstanbul, Türkiye*





*İstanbul Üniversitesi, İstanbul Tıp Fakültesi, Nöroloji Anabilim dalı, Davranış Nörolojisi ve Hareket Bozukluğu Birimi, 34093 Çapa, İstanbul, Türkiye*

## Özet

**Amaç:** Parkin genindeki mutasyonlar otozomal resesif geçişli Parkinson Hastalığı'nın en sık nedenidir. Parkinson hastalarında çeşitli oranlarda kognitif bozukluğun olduğu bilinmesine rağmen Parkin mutasyonu taşıyan hastaların kognitif durumları ile ilgili bilgilerimiz sınırlıdır. Bu çalışmanın amacı Parkin mutasyonu taşıyan hastalar-daki kognitif işlevlerin geniş kapsamlı bir Nöropsikolojik Test (NPT) bataryası ile araştırılmasıdır.

**Materyal ve Metod:** Katılımcılar 12 sağlıklı ve 27 demansı olmayan PH hastasından oluşmaktaydı. Gruplar sağlıklı kontrol, Parkin mutasyonlu (PM-PH), Erken Başlangıçlı Parkinson Hastalığı (EB-PH) ve Geç Başlangıçlı Parkinson Hastalığı (GB-PH) olarak oluşturuldu. Katılımcıların kognitif süreçlerinin değerlendirilmesi yönelik; Sayı Menzili Testi (SMT), Sözel Bellek Süreçleri Testi (SBST), Benton Çizgilerin Yönünü Belirleme Testi (BÇYBT), Benton Yüz Tanıma Testi (BYTT), Boston Adlandırma Testi (BAT), Wisconsin Kart Eşleme Testi (WKET), İz Sürme Testi (İST), Sözel Akıcılık Testi (SAT) ve Stroop Testi (ST)'ni içeren NPT bataryası uygulandı.

**Bulgular:** Benton Yüz Tanıma Testi'nde PM-PH ile kontrol grubu arasında istatistiksel olarak anlamlı fark bulunmazken, kontrol grubu ile EB-PH ( $p=0.049$ ) ve GB-PH ( $p=0.014$ ) arasında anlamlı fark bulundu. Diğer testlerden BÇYBT'de ( $p=0.001$ ), İST'nin A ve B Formu-Sürede ( $p=0.001$ ), SAT-Hayvanlar ( $p=0.033$ ), SAT-K harfi ( $p=0.032$ ) ve BNT'de ( $p=0.031$ ) kontrol grubu ile PM-PH, EB-PH GB-PH arasında istatistiksel olarak anlamlı fark saptandı. SBST-Toplam ( $p=0.003$ ) ve en yüksek öğrenmede ( $p=0.002$ ) kontrol grubu ile tüm PH grupları arasında anlamlı fark bulundu. Diğer NPT testleri için kontroller ve hasta grupları arasında anlamlı fark yoktu.

**Sonuç:** Bu çalışmadaki NPT bulguları Parkin mutasyonu taşıyan hastaların kognitif süreçlerinin en az idyopatik PH'ndaki kadar etkilendiğini göstermektedir.

Assessment of Cognitive Dysfunction in Parkinson Patients with Parkin Mutations by Neurophysiological Tests  
Hasan Demirci<sup>1</sup>, Atilla Uslu<sup>2</sup>, Ebba Lohman<sup>3</sup>, Hasmet Hanagasi<sup>3</sup>, Tamer Demiralp<sup>2</sup>

<sup>1</sup> Istanbul University, Research Institute for Experimental Medicine, Department of Neuroscience, 34093 Capa, Istanbul, Turkey

<sup>2</sup> Istanbul University, Istanbul Faculty of Medicine, Department of Physiology, 34093 Capa, Istanbul, Turkey

<sup>3</sup> Istanbul University, Istanbul Faculty of Medicine, Department of Neurology, Behavioral Neurology and Movement Disorders Unit, 34093 Capa, Istanbul, Turkey

## Abstract

**Objectives:** Mutations on the parkin gene are the most frequent reason of autosomal recessive Parkinson Disease. Even though it is known that Parkinson patients have cognitive defects in different levels, our knowledge about cognition of patients with parkin mutation is limited. Aim of the present study is to research cognitive functions of patients with parkin mutation by using a comprehensive Neuropsychological Test (NPT) battery

**Materials and methods:** The participants consisted of 12 healthy volunteers and 27 non-demented PD patients. The participants were divided in four groups as healthy controls, PD patients with Parkin mutations (PM-PD), early onset (EO-PD) and late onset stage (LO-PD). NPTs were applied to the participants in order to examine cognitive processes, containing the Digit Span Test (DST), Verbal Memory Processes Test (VMPT), Benton's Line Orientation Test (BLOT), Benton's Facial Recognition Test (BFRT), Boston Naming Test (BNT), Wisconsin Card Sorting Test (WCST), Trail Making Test (TMT), Verbal Fluency Tests (VFT) and Stroop Test (ST).

**Results:** On BFRT, there was no any statistically significant difference between the control group and PM-PD patients but it was found that there is a significant difference between control group and EO-PD ( $p=0.049$ ) and also between control group and LO-PD ( $p=0.014$ ). Also, signifi